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Non Invasive Imaging

PROGNOSTIC VALUE OF PULMONARY VENOUS FLOW DOPPLER SIGNALS IN PATIENTS WITH NORMAL EJECTION FRACTION AND THEIR CONTRIBUTION TO THE DIASTOLIC GRADING PARADIGM

Poster Contributions
Hall C
Sunday, March 30, 2014, 3:45 p.m.-4:30 p.m.

Session Title: Non Invasive Imaging: Myocardial Strain, Cardiac Mechanics and Diastolic Function
Abstract Category: 15. Non Invasive Imaging: Echo
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Background: Pulmonary venous flow parameters (PVFP) have only a supporting role in diastolic grading in recent guidelines due to lack of studies assessing their prognostic role in patients with normal ejection fraction (EF).

Methods: Routine diastolic (left atrial volume index, mitral inflow, tissue Doppler) and PVFP (systolic (S) and diastolic (D) pulmonary vein flow peak velocity and integral, their ratios, duration of the atrial regurgitant flow (Ar) velocity, and its difference from mitral A-wave duration (Δ Ar-A) were measured in 365 consecutive patients in sinus rhythm and EF>50% (age 64.9±19; 52% female) by a single sonographer. Time to re-admission to heart failure and to a combined cardiac end point (cardiac death, heart failure, atrial fibrillation) were correlated to echo parameters.

Results: PVFP were obtainable in 92% of patients and Ar in 75%. S integral (Hazard ratio 0.85;p=0.0006), D peak (1.02;p=0.05), S/D peak ratio (0.37;p=0.03), S/D integral ratio (0.33;p=0.001), S integral to D peak ratio (SI/DP; 0.01;p=0.0002), and Δ Ar-A (0.98;p=0.03) were all associated with time to re-admission for heart failure. Only S integral (HR 0.91[0.86-0.97]; p=0.007), SI/DP (0.06[0.007-0.48]; p=0.008), and Δ Ar-A (0.98[0.97-0.99]; p=0.008) were associated with time to a combined cardiac end point. Long Δ Ar-A and low SI/DP independently predicted higher heart failure rate and combined outcome rate adjusted for E/e' and left atrial volume index (p <0.05 for both). The addition of these parameters to diastolic grading, recognized patients with pseudo-normal filling pattern (normal E/A, e' and LA volume index) and short Δ Ar-A (<0 msec), or high SI/DP (>0.3 cm/ [cm/sec]) with similar clinical outcomes to Grade I (p >0.5), but better clinical outcomes than in the other pseudo- normal patients (p <0.01).

Conclusions: PVFP are obtainable in most patients, and add considerable prognostic information on top of routine diastolic parameters in patients with normal EF. PVFP recognize an additional stage that occurs at an early stage of diastolic dysfunction in which e' is already reduced, E/A ratio is normal, E/e' is increased but with excellent outcome although resembling the pseudo-normal pattern.